

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 11-K

- ANNUAL REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2016.

OR

- TRANSITION REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File No. 1-31690

- A. Full title of the plan and the address of the plan, if different from that of the issuer named below:

**TransCanada 401(k) and Savings IBEW 1245 Plan
TransCanada USA Services Inc., 700 Louisiana Street, Suite 700
Houston, Texas 77002-2700**

- B. Name of issuer of the securities held pursuant to the plan and the address of its principal executive office:

**TransCanada Corporation
450 – 1 Street S.W., Calgary, Alberta, T2P 5H1, Canada**

TRANSCANADA 401(k) AND SAVINGS IBEW 1245 PLAN

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TRANSCANADA 401(k) AND SAVINGS IBEW 1245 PLAN
STATEMENTS OF NET ASSETS AVAILABLE FOR BENEFITS

| <i>December 31 (thousands of U.S. dollars)</i> | 2016 | 2015 |
|--|-----------------|----------|
| Assets | | |
| Investments at fair value (Note 3) | \$ 5,580 | \$ 5,426 |
| Notes receivable from participants | 225 | 164 |
| Employer contribution receivable | 2 | 1 |
| Net Assets Available for Benefits | \$ 5,807 | \$ 5,591 |

The accompanying notes to the financial statements are an integral part of these statements.

TRANSCANADA 401(k) AND SAVINGS IBEW 1245 PLAN
STATEMENT OF CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS

| <i>Year ended December 31 (thousands of U.S. dollars)</i> | 2016 |
|---|-------------|
| Additions | |
| Contributions | |
| Employee contributions | \$ 354 |
| Employer contributions | 94 |
| | 448 |
| Investment Income | |
| Net appreciation in fair value of investments (Note 3) | 244 |
| Interest and dividend income | 166 |
| | 410 |
| Interest on notes receivable from participant | 7 |
| Other revenue | 3 |
| Total Additions | 868 |
| Deductions | |
| Benefits paid to participants | 648 |
| Administrative expenses | 4 |
| Total Deductions | 652 |
| Increase in Net Assets Available for Benefits | 216 |
| Net Assets Available for Benefits | |
| Beginning of Year | 5,591 |
| End of Year | \$ 5,807 |

The accompanying notes to the financial statements are an integral part of these statements.

TRANSCANADA 401(K) AND SAVINGS IBEW 1245 PLAN

NOTES TO FINANCIAL STATEMENTS

NOTE 1: DESCRIPTION OF PLAN

The TransCanada 401(k) and Savings IBEW 1245 Plan (the Plan) is a defined contribution plan that provides retirement benefits for employees of TransCanada USA Services Inc. (TCUSA or the Company) or its subsidiaries covered under a collective bargaining agreement with the International Brotherhood of Electrical Workers (IBEW) 1245. Employees may enroll when they have attained the age of 21 and completed 11 months of service by the end of a 12 month period with the Company. The Plan excludes employees hired under the Company's student program. The Plan is subject to the provisions of the *Employee Retirement Income Security Act of 1974* (ERISA).

The Board of Directors of TCUSA has appointed Fidelity Management Trust Company (Fidelity or the Trustee) as custodian and trustee of the Plan's assets.

Employee and Employer Contributions

Each year, participants may elect to defer a percentage of their eligible compensation into the Plan subject to an annual limit of the lesser of 60 per cent of their eligible contribution or \$18,000, subject to certain limitations under the Internal Revenue Code (the Code). Participants age 50 or older who make deferral contributions may also make catch-up contributions of up to \$6,000. The Company will match 50 per cent of each participant's contributions up to a maximum of six per cent of the participant's eligible compensation for the Plan year. To be eligible for employer-matching contributions, participants must have completed 11 months of service by the end of a 12 month period with the Company. Participants may contribute amounts transferred to the Plan from another qualified plan at the participant's request (rollover).

Participant Accounts

Each participant's account is credited with the participant's and Company's contribution and an allocation of the Plan earnings. Earnings are allocated from a particular fund based on the ratio of a participant's account invested in the fund to all participants' investments in that fund. Plan expenses are generally paid by the Company, which is the Plan Sponsor. Participant accounts are charged an administration fee related to their outstanding loans and certain investment expenses reduced the investment income presented in these financial statements.

Participants are responsible for investment decisions relating to the investment of assets in their account. The Trustee carries out all investing transactions on behalf of the participant. In the event investment instructions are not received from the participant, the investment contributions are allocated to the Plan's qualified default option, the Fidelity Freedom K target date funds, based upon the participant's expected date of retirement.

Investment in TransCanada Corporation

Stock of TransCanada Corporation (TransCanada), indirect parent company of TCUSA, is available to participants in the Plan. A participant may elect to invest up to 10 per cent of contributions into TransCanada stock. Participants may elect to exchange up to 10 per cent of their existing account balance into TransCanada stock, subject to a 10 per cent maximum account value. Additionally, no more than 10 per cent of any rollover contribution can be invested in TransCanada stock.

Vesting

Participants are immediately vested in their contributions, including rollovers, employer contributions and any earnings thereon. Employee rollovers are amounts transferred to the Plan from another qualified plan at the participant's request.

Notes Receivable from Participants

Participants may borrow from their fund accounts a minimum of \$1,000 up to a maximum equal to the lesser of \$50,000 reduced by the highest outstanding note balance in their account during the prior 12 month period or 50 per cent of their vested account balance. Note terms range from one to five years for general notes or up to 10 years for the purchase of a primary residence. The notes are secured by the balance in the participant's account and bear interest at a reasonable interest rate, as determined by the Plan Administrator, based on prevailing market interest rates at the time. Interest rates remain fixed throughout the duration of the term. The interest rate on notes outstanding at December 31, 2016 was between 4.25 per cent and 4.50 per cent (2015 - 4.25 per cent). Principal and interest are paid through payroll deductions.

A note receivable from a participant shall be considered in default if any scheduled repayment remains unpaid as of the last business day of the calendar quarter following the calendar quarter in which the note is initially considered past due. In the event of a default or termination of employment the entire outstanding note and accrued interest is considered to be a deemed distribution to the participant.

Payment of Benefits

Participants are eligible to request a distribution of their vested amounts upon retirement, death, total and permanent disability, severance of employment with the Company or, in very limited circumstances, in the event of financial hardship. Distributions are made in the form of a lump-sum payment or a rollover to another qualified account.

A participant's normal retirement age is 65, however, a participant may elect to withdraw all or a portion of his or her contributions after the age of 59½, subject to certain conditions.

Forfeitures

As participants are immediately 100 per cent vested in their account balance, there are no forfeitures. Employer contributions that are not vested are forfeited if the participant's employment is terminated for reasons other than death or retirement, and are used first to pay administrative expenses and next to reduce future employer contributions.

Administrative Expenses

The Plan Administrator is responsible for filing all required reports on behalf of the Plan. The Company provides or pays for certain accounting, legal and management services on behalf of the Plan. The Company has not charged the Plan for these expenses or services. Loans and other transaction specific fees are charged to the accounts of participants electing such transaction. Certain investment related expenses, including management fees, are paid by the mutual funds the Plan invests in including those sponsored by an affiliate of Fidelity. These expenses are presented as a reduction of investment income.

Plan Termination

Although it has not expressed any intent to do so, with approval from its Board of Directors, the Company has the right under the Plan to discontinue contributions at any time and to terminate the Plan, subject to the provisions of ERISA. In the event of Plan termination, participants would be 100 per cent vested in their accounts.

NOTE 2: SUMMARY OF ACCOUNTING POLICIES

Basis of Accounting

The financial statements of the Plan are prepared on an accrual basis of accounting in accordance with U.S. generally accepted accounting principles.

Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, and changes therein, and disclosure of contingent assets and liabilities. Actual results could differ from these estimates.

Investment Valuation and Income Recognition

The Plan's investments are stated at fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. See Note 3 for discussion of fair value measurements.

Interest income is recorded on the accrual basis and dividends are recorded on the ex-dividend date.

Net Appreciation in Fair Value of Investments consists of: (1) the unrealized gains or losses on investments held during the year and (2) the realized gains or losses recognized on the sale of investments during the year. Realized gains and losses from security transactions are reported on the average cost basis.

Purchases and sales of securities are recorded on a trade-date basis.

Notes Receivable from Participants

Notes Receivable from Participants includes the unpaid principal balance plus accrued interest. Delinquent notes receivable from participants are recorded as a distribution based upon the terms of the plan document.

Other Revenue

The agreement between the Trustee and the Plan includes a revenue sharing arrangement whereby the Trustee shares revenue generated by the Plan that was paid from the mutual fund holdings sponsored by an affiliate of the Trustee. These deposits are included in the other revenue amount in the statement of changes in net assets available for benefits. The funds can be used to pay plan expenses or be allocated to participants. Income from revenue sharing during 2016 was \$3,189 of which \$494 remains available at December 31, 2016 for allocation to participants or to offset future plan expenses (2015 - \$6,688).

Payment of Benefits

Benefits are recorded when paid.

Changes in Accounting Policies for 2016

In July 2015, the FASB issued ASU 2015-12, Plan Accounting: Defined Benefit Pension Plans (Topic 960), Defined Contribution Pension Plans (Topic 962), Health and Welfare Benefit Plans (Topic 965). This new guidance was effective January 1, 2016, and was applied retrospectively and resulted in changes to disclosure. ASU 2015-12 eliminates disclosure requirements for individual investments that represent 5 percent or more of net assets available for benefits and the net appreciation or depreciation for investments by general type. It also states that investments of employee benefit plans will be grouped only by general type and if an investment is measured using the net asset value per share (or its equivalent) practical expedient and that investment is in a fund that files a U.S. Department of Labor Form 5500 as a direct filing entity, disclosure of that investment's strategy is no longer required.

NOTE 3: INVESTMENTS

Participants direct the investment of their account balances into a broad range of investment securities offered by the Plan. Investment securities are exposed to various risks, such as counterparty credit risk, liquidity risk and market risk. Due to the level of risk associated with certain investment securities and the level of uncertainty related to changes in value of these investments, it is reasonably possible that changes in the values of investment securities may occur in the near term and that such changes could materially affect participant account balances and the amounts reported in the financial statements.

The Plan offers alternatives that may mitigate participant risks, including the opportunity to diversify investments across multiple participant-directed fund elections including active and passively managed funds covering multiple asset classes. Additionally, the investments within each participant-directed fund election are further diversified into various financial instruments, with the exception of the TransCanada Stock Fund, which invests in securities of a single issuer.

The Plan's exposure to credit loss in the event of nonperformance of investments is limited to the carrying value of such instruments. The Plan's concentrations of credit risk, interest rate risk and market risk are dictated by the Plan's provisions as well as those of ERISA and the participants' investment preference.

Fair Value Hierarchy

The Plan's financial assets and liabilities recorded at fair value have been categorized into three categories based on a fair value hierarchy. In Level I, the fair value of assets and liabilities is determined by reference to quoted prices in active markets for identical assets and liabilities. In Level II, determination of the fair value of assets and liabilities includes valuations using inputs, other than quoted prices, for which all significant outputs are observable, directly or indirectly. This category includes fair value determined using valuation techniques, such as option pricing models and extrapolation using observable inputs. In Level III, determination of the fair value of assets and liabilities is based on inputs that are not readily observable and are significant to the overall fair value measurement. There were no Level II or Level III investments or transfers between levels in 2016 or 2015.

Common Stock: Valued at the closing price reported on the New York Stock Exchange.

Mutual Funds: Valued at the daily closing price reported by the fund. Mutual funds held by the Plan are open end mutual funds that are registered with the Securities and Exchange Commission. These funds are required to publish their daily net asset value and transact at that price. The mutual funds held by the Plan are deemed to be actively traded.

Financial assets measured at fair value on a recurring basis are classified in the Level I fair value category as follows:

| <i>December 31 (thousands of U.S. dollars)</i> | Quoted Prices in Active Markets (Level I) | |
|--|--|-----------------|
| | 2016 | 2015 |
| Mutual funds | \$ 5,488 | \$ 5,368 |
| Common stock and other | 92 | 58 |
| Investments at Fair Value | \$ 5,580 | \$ 5,426 |

The categories above for Mid/Large Cap Stock and Fixed Income include target dated funds in the amount of \$0.7 million and \$0.9 million as of December 31, 2016 and 2015, respectively.

Net Appreciation in Fair Value of Investments

Net Appreciation in Fair Value of Investments by major category (including investments purchased, sold and held during the year) was as follows:

| <i>Year ended December 31 (thousands of dollars)</i> | 2016 |
|--|---------------|
| Mutual funds | \$ 221 |
| Common stock and other | 23 |
| Net Appreciation in Fair Value of Investments | \$ 244 |

NOTE 4: INCOME TAXES

Effective November 13, 2015, the Plan was restated to a volume submitter plan as covered by an Advisory Letter from the Department of Treasury. The Plan Administrator believes that the Plan is designed and is currently being operated in compliance with the applicable requirements of the Code. The Plan is exempt from federal income taxes. Accordingly, no provision for federal income taxes has been made in the accompanying financial statements.

The Plan Administrator has analyzed any income tax assets and liabilities of the Plan and has concluded that as of December 31, 2016 and 2015, there are no uncertain income tax positions taken or expected to be taken that would require recognition of a liability or asset, or disclosure in the financial statements. The Plan is subject to audits by taxing jurisdictions, however, there are currently no audits in progress for any tax periods. The Plan Administrator believes it is no longer subject to income tax examinations for years prior to 2013.

NOTE 5: PARTY-IN-INTEREST AND RELATED PARTY TRANSACTIONS

Certain Plan investments are shares of mutual funds managed by an affiliate of Fidelity, the Trustee, therefore these transactions qualify as party-in-interest transactions.

In 2016, the Company incurred \$382 (2015 - \$173) of administrative expenses, as described in Note 1, on behalf of the Plan and are not reflected within these financial statements. The Company has not charged the Plan for these expenses.

At December 31, 2016, Plan investments included \$90,737 (2015 – \$57,163) of TransCanada common stock and \$1,392 (2015 – \$1,142) in a stock purchase account. Transactions involving these investments are permitted party-in-interest transactions.

NOTE 6: SUBSEQUENT EVENTS

The Plan has evaluated subsequent events through the date these financial statements were issued.

TRANSCANADA 401(k) AND SAVINGS IBEW 1245 PLAN

EIN #: 98-040263

PLAN #: 003

FORM 5500 SCHEDULE H, PART IV, LINE 4i – SCHEDULE OF ASSETS (HELD AT END OF YEAR)
AS OF DECEMBER 31, 2016

| (a) | (b) Identity of Issuer, Borrower, Lessor or Similar Party | (c) Description of Investment | (d) Cost of Investment** | (e) Current Value |
|-----|---|--|--------------------------------|-------------------------|
| * | Fidelity® 500 Index Fund | Mutual Fund | | \$ 1,334,881 |
| | Baron Asset Fund | Mutual Fund | | 683,342 |
| * | Fidelity® Diversified International Fund | Mutual Fund | | 677,219 |
| | JP Morgan Equity Income Fund | Mutual Fund | | 560,424 |
| * | Fidelity® Government Retirement Money Market II Portfolio | Mutual Fund | | 516,156 |
| | Mainstay Large Cap Growth Fund | Mutual Fund | | 253,277 |
| | Artisan Mid Cap Value Fund | Mutual Fund | | 236,783 |
| * | Fidelity® Small Cap Index Fund | Mutual Fund | | 225,147 |
| * | Fidelity Freedom K® 2010 Fund | Mutual Fund | | 125,586 |
| * | Fidelity Freedom K® 2025 Fund | Mutual Fund | | 121,622 |
| * | Fidelity Freedom K® 2045 Fund | Mutual Fund | | 107,665 |
| * | Fidelity Freedom K® 2020 Fund | Mutual Fund | | 99,398 |
| * | Fidelity Freedom K® 2050 Fund | Mutual Fund | | 92,437 |
| * | Fidelity Freedom K® 2030 Fund | Mutual Fund | | 74,467 |
| * | Fidelity Freedom K® 2040 Fund | Mutual Fund | | 69,739 |
| * | Fidelity® US Bond Index Fund | Mutual Fund | | 68,085 |
| * | Fidelity® Extended Market Index Fund | Mutual Fund | | 68,058 |
| * | Fidelity® Inflation Protected Bond Index Fund | Mutual Fund | | 42,817 |
| * | Fidelity Freedom K® 2015 Fund | Mutual Fund | | 35,604 |
| | Baird Core Plus Bond Fund | Mutual Fund | | 35,028 |
| * | Fidelity Freedom K® Income | Mutual Fund | | 27,306 |
| * | Fidelity Freedom K® 2035 Fund | Mutual Fund | | 17,412 |
| | Vanguard Total International Stock Index Fund | Mutual Fund | | 8,726 |
| * | Fidelity Freedom K® 2055 Fund | Mutual Fund | | 6,857 |
| | Total Mutual Funds | | | \$ 5,488,036 |
| * | TransCanada Corporation | Common Stock | | 90,737 |
| * | Fidelity Cash Reserve | Stock Purchase Account | | 1,392 |
| * | Participant Loans | Interest rate ranging from 4.25% to 4.50% maturing through 2021 | | 224,384 |
| | Total Investments | | | \$ 5,804,549 |

* Represents a party-in-interest (Note 5).

** Cost omitted for participant-directed investments.

SIGNATURES

The Plan. Pursuant to the requirements of the Securities Exchange Act of 1934, the trustee (or other persons who administer the employee benefit plan), have duly caused this annual report to be signed on its behalf by the undersigned, thereunto duly authorized.

Date: June 14, 2017

TransCanada 401(k) and Savings IBEW 1245 Plan

By: /s/ Jon A. Dobson
Jon A. Dobson
Member
TransCanada USA Investment Committee